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## NOTES FROM PACIFIC COAST OBSERVATORIES.

### NOTE ON THE DETERMINATION OF RADIAL VELOCITIES OF NEBULÆ.

For several years it has been planned, as soon as opportunities should come, to measure the radial velocities of all so-called gaseous nebulæ whose intrinsic brightnesses are sufficient to record their spectra in exposures of reasonable lengths.

Observations of the southern nebulæ were begun in 1911 by Messrs. MOORE and SANFORD of the D. O. Mills Expedition, and they have secured measurable spectrograms of eight nebulæ not hitherto observed for this purpose. Similar observations were begun at Mount Hamilton in the early summer of 1913 by Mr. MERRILL, Fellow in the Lick Observatory, and continued until September, when he assumed new duties as a member of the staff of the Detroit Observatory. Since September the observations have been continued chiefly by Messrs. PADDOCK and HAYNES. Confirmatory spectrograms have been secured for nine of the thirteen planetary nebulæ observed in 1890-91 by KEELER, and for fifteen additional northern nebulæ.

Some interesting results of the recent northern observations are described in the following note. W. W. CAMPBELL.

November, 1913.

#### A NEBULA WITH LARGE RADIAL VELOCITY.

The velocities of approach or recession recently determined here for fifteen nebulæ are in accord with KEELER's results for thirteen other (planetary) nebulæ, viz.: the average velocity is high.

The tenth-magnitude planetary nebula, No. 4846 in the Second Index of Dreyer's New General Catalogue (R. A. =  $19^{\text{h}} 11^{\text{m}}.0$ , Dec. =  $-79^{\circ} 14'$ ), has an abnormally high velocity. The mean of the observed velocities obtained from three

photographs is approximately  $150^{\text{km}}$  per second, recession, with reference to the Sun; or, correcting for the effect of the solar motion,  $165^{\text{km}}$  per second with reference to the stellar system.

The results for the other fourteen nebulae vary from about  $60^{\text{km}}$  approach per second to about  $60^{\text{km}}$  recession, with reference to the stellar system.

W. W. CAMPBELL,  
E. S. HAYNES.

#### A SOUTHERN NEBULA WITH LARGE RADIAL VELOCITY.

Two spectrograms of the planetary nebula N. G. C. 5873 ( $\alpha = 15^{\text{h}} 6^{\text{m}}.3$ ;  $\delta = -37^{\circ} 43'$ ) were obtained with the one-prism spectrograph at the D. O. Mills Observatory, Santiago, Chile, in March, 1913. The mean of the measures of these two plates by Miss HOBE, Mrs. MOORE, and Mr. MOORE give for the radial velocity of the nebula with reference to the Sun  $-136^{\text{km}}$  per second. Its velocity in the line of sight referred to the stellar system is therefore  $-133^{\text{km}}$  per second. The velocity determinations depends upon measures of the nebular lines  $\lambda\lambda$  4340, 4686, 4861, 4959, and 5007.

J. H. MOORE.

#### A STAR WITH A REMARKABLE RADIAL VELOCITY.

In the course of our observations of the radial velocities of the fainter stars with measured parallaxes, we have found the star Lalande 1966 ( $\alpha$  1900 =  $1^{\text{h}} 3^{\text{m}}.3$ ) to have an extraordinarily high velocity. Three spectrograms of the star give the following values:—

1913 Sept. 17	$-326^{\text{km}}$
Oct. 10	325
Oct. 17	323
	<hr/>
	$-325$

The spectral type of the star is F3. The parallax of the star as found by the Yale observers is  $+0''.08$ . If we assume this value and the proper motion given by KAPTEYN, we find the motion in space to be  $320^{\text{km}}$  per second, directed toward the apex  $\alpha = 188^{\circ}$ ,  $\delta = -59^{\circ}$ .

W. S. ADAMS,  
A. KOHLSCHÜTTER.